

CLAIMS

What is claimed is:

1. A carriage for an ink cartridge of an image forming apparatus comprising:
a carriage body having a mounting portion, in which the ink cartridge is accommodated;
a latch rotatably disposed at the carriage body to open and close the mounting portion;
a resilient latch member to resiliently bias the latch in an opening direction; and
a locking unit to lock the latch to the carriage body,
wherein when the latch is unlocked with respect to the carriage body, the locking unit rotates together with the latch, and draws out the ink cartridge from the mounting portion.
2. The carriage of claim 1, wherein the locking unit comprises:
a locking projection disposed at a first wall of the carriage body;
a hook member, hinged on the latch to be selectively hooked with the locking projection,
that when the latch is released, the hook member hooks with the ink cartridge; and
a release handle to release the hook member from the locking projection.
3. The carriage of claim 2, wherein the hook member comprises:
an ascending protrusion that hooks with the ink cartridge to lift the ink cartridge when the latch is released.
4. The carriage of claim 3, wherein:
a pair of the hook members are disposed on opposing walls of the carriage body, with
the ink cartridge being selectively interposed therebetween.
5. The carriage of claim 2, wherein:
the release handle is disposed at the latch coaxially with the hook member.
6. The carriage of claim 2, wherein:
the release handle is disposed at the latch on a different axis from the hook member.
7. The carriage of claim 5, wherein the locking unit further comprises:

a resilient release handle member interposed between the release handle and the hook member, to resiliently compress the hook member to closely contact the locking projection.

8. The carriage of claim 3, wherein:

the hook member, the locking projection and the ascending protrusion are respectively provided with sliding slants, and when a user presses an upper surface of the latch, the sliding slants on the hook member and the locking projection slide on each other to lock the latch.

9. A carriage for an ink cartridge of an image forming apparatus comprising:

a carriage body having a mounting portion, in which the ink cartridge having a latching portion is accommodated;

a latch rotatably disposed at the carriage body to close the mounting portion by locking, that when unlocking with respect to the carriage body, draws the ink cartridge out of the mounting portion;

a resilient latch member to resiliently bias the latch in an opening direction; and

a locking unit to lock the latch to the carriage body.

10. The carriage of claim 9, wherein the latch comprises:

a latch body; and

a guide arm extended from the latch body to guide a side surface of the ink cartridge.

11. The carriage of claim 10, wherein the guide arm comprises:

a first guide portion that hooks into the latching portion to lift the ink cartridge, when the latch is unlocked; and

a second guide portion extended stepwise from the first guide portion, to guide a side of the latching portion.

12. The carriage of claim 9, wherein the locking unit comprises:

a locking projection disposed at a sidewall of the carriage body;

a hook member hinged on the latch and selectively hooked into the locking projection;

and

a release handle to release the hook member from the locking projection.

13. The carriage of claim 9, further comprising:
a sliding unit that limits an opening angle of the latch with respect to the carriage body.
14. The carriage of claim 13, wherein the sliding unit comprises:
a sliding protrusion disposed on the latch; and
a sliding hole portion disposed on the carriage body opposite to the sliding protrusion, to accommodate the sliding protrusion.
15. The carriage of claim 14, wherein the sliding hole portion comprises:
a first penetrating hole receiving the sliding protrusion at a first position when the latch is locked;
a second penetrating hole receiving the sliding protrusion at a second position when the latch is opened; and
a connection portion connecting the first and the second penetrating holes.
16. The carriage of claim 15, wherein the connection portion has a distance defined between opposing surfaces thereof that is smaller than a diameter of the sliding protrusion.
17. The carriage of claim 13, wherein:
a first imaginary line, which is parallel to an upper surface of the latch in a locked position, and a second imaginary line, which is parallel to the upper surface of the latch in an opened position, form an interior angle ranging from about 20° to about 30°.
18. The carriage of claim 17, wherein the interior angle is approximately 21°.
19. A carriage for an ink cartridge, comprising:
a carriage body, movable on a guide rail, and having a mounting portion to receive the ink cartridge, and an opening, through which the ink cartridge is selectively installed;
a latch, rotatably connected to the carriage body, to selectively open and close the opening; and
a locking unit to lock the latch to the carriage body,
wherein the ink cartridge is lifted from the mounting portion when the latch opens the opening.

20. The carriage according to claim 19, further comprising:
a plunger; and
a spring, connected at a first end to the latch, and connected at a second end to the plunger,
wherein the plunger secures the ink cartridge in a mounted position when the latch closes the opening.

21. The carriage according to claim 19, further comprising:
a plunger,
wherein the plunger is integrally formed with the latch and the plunger elastically deforms to secure the ink cartridge in a mounted position when the latch closes the opening.

22. The carriage according to claim 19, further comprising:
a resilient latch member to bias the latch in an opening direction.

23. The carriage according to claim 19, wherein the locking unit comprises:
a locking projection connected to the carriage body;
a release handle rotatably connected to the latch; and
a hook member rotatably connected to the latch, that engages and disengages the locking projection when the release handle is rotated in a locking direction and an unlocking direction, respectively.

24. The carriage according to claim 23, wherein:
the release handle and the hook member are integrally formed.

25. The carriage according to claim 23, wherein:
the hook member comprises
a locking protrusion that engages the locking projection, and
an ascending protrusion; and
the ink cartridge comprises a latching portion,
wherein the ascending portion engages the latching portion to lift the ink cartridge when the latch opens the opening.

26. The carriage according to claim 25, further comprising:
a pair of locking projections provided on opposing sides of the carriage body,
respectively; and
a pair of hook members provided on opposing sides of the latch, respectively,
wherein the pair of hook members simultaneously engage the pair of locking projections
to maintain the latch in a predetermined position when the latch opens and closes the opening.

27. The carriage according to claim 23, wherein:
the hook member and the release handle rotate coaxially.

28. The carriage according to claim 27, wherein:
the hook member and the release handle are integrally formed, and rotate concurrently.

29. The carriage according to claim 23, wherein:
the hook member and the release handle rotate concurrently.

30. The carriage according to claim 23, wherein the release handle comprises:
a resilient release handle member to bias the hook member toward the locking
projection.

31. The carriage according to claim 30, wherein the resilient release handle member
comprises:
a spring mounted on an axis of rotation of the release handle.

32. The carriage according to claim 30, wherein the resilient release handle member
comprises:
a spring interposed between the latch and the release handle.

33. The carriage according to claim 23, wherein:
the locking projection is positioned at a side wall of the carriage body.

34. The carriage according to claim 25, wherein:

the locking projection comprises a sliding slant; and
the locking protrusion comprises a sliding slant that corresponds to the locking projection sliding slant, so that respective engaging surfaces of the locking projection and the locking protrusion slide on each other when the latch opens and closes the opening.

35. The carriage according to claim 25, wherein:
the ascending protrusion comprises a sliding slant to aid engagement between the ascending protrusion and the latching portion of the ink cartridge.

36. The carriage according to claim 23, wherein the latch comprises:
a latch body rotatably connected to the carriage body; and
a guide arm extending from the latch body to guide side surfaces of the ink cartridge.

37. The carriage according to claim 36, wherein:
the ink cartridge comprises a latching portion positioned at the side surfaces of the ink cartridge; and
the guide arm comprises
a first guide portion that engages the latching portion to lift the ink cartridge when the latch opens the opening, and
a second guide portion extending stepwise from the first guide portion to guide the latching portion.

38. The carriage according to claim 37, wherein:
the guide arm has a predetermined curvature so that the ink cartridge moves toward the mounting portion when the ink cartridge is removed from the carriage body.

39. The carriage according to claim 38, wherein:
an area where a first surface of the first guide portion contacts a first portion of the latching portion increases as the latch opens the opening.

40. The carriage according to claim 36, further comprising:
a sliding unit to limit an opening angle of the latch.

41. The carriage according to claim 40, wherein the sliding unit comprises:
a sliding protrusion protruding from the latch body; and
a sliding enclosure positioned in the carriage body to correspond to the sliding protrusion, and in which the sliding protrusion moves.
42. The carriage according to claim 41, wherein the sliding protrusion is approximately cylindrical.
43. The carriage according to claim 42, wherein the sliding enclosure comprises:
a first enclosure region;
a second enclosure region; and
a connection region, connecting the first and second enclosure regions,
wherein the sliding protrusion is received in the first enclosure region when the latch has closed the opening, and the sliding protrusion is received in the second enclosure region when the latch has opened the opening.
44. The carriage according to claim 43, wherein:
the first and second enclosure regions have approximately the same diameter.
45. The carriage according to claim 43, wherein:
a diameter of the first enclosure region is larger than a diameter of the second enclosure region.
46. The carriage according to claim 43, wherein:
a distance between opposing surfaces of the connection region is smaller than a diameter of the sliding protrusion.
47. The carriage according to claim 46, wherein:
the distance between the opposing surfaces of the connection region is approximately 80-90% of the diameter of the sliding protrusion.
48. The carriage according to claim 40, wherein:

the opening angle is limited by the sliding unit to approximately 20-30°, wherein the opening angle is defined at an intersection between a first imaginary line parallel to a first surface of the latch when the latch has closed the opening, and a second imaginary line parallel to the first surface of the latch when the latch has opened the opening.

49. The carriage according to claim 48, wherein:
the opening angle is limited by the sliding unit to approximately 21°.

50. A carriage for an ink cartridge, comprising:
a carriage body, having an opening, through which the ink cartridge is selectively installed;
a latch, rotatably connected to the carriage body, to selectively open and close the opening; and
a locking unit to lock the latch to the carriage body,
wherein the ink cartridge is lifted when the latch opens the opening.